Research objectives

1. To estimate the average gestational length of pregnant women (irrespective of the parity) who had first trimester ultrasound scan and who underwent spontaneous onset of labour in white, South Asian or black racial groups

2. To determine if the average gestational length of pregnant women (irrespective of parity)who had first trimester ultrasound scan and who underwent spontaneous onset of labour differed significantly between white, South Asian or black racial groups

3. To investigate if the difference of average cervical length in the 10-13+6 weeks and 20-22+6 weeks of gestation by racial groups.

4. To identify the difference in cervical length measurement in first and the second trimester

5. To correlate the changes in cervical length during two trimesters to the gestational age of delivery in different ethnic groups.

Hypothesis

The null hypotheses:

1. There is no difference in the average gestation at which spontaneous delivery occurs in different racial groups.

2. There is no difference in cervical length between white, Asian and black   women with singleton pregnancy during the first trimester and at 22 weeks of gestation.

Data analysis

The analysis is based on a historical cohort study undertaken in the antenatal scanning area in antenatal clinic and labour ward at university college hospital, London. All the singleton pregnancies irrespective of their parity, who accepted Trans - vaginal cervical scan at 10 – 14 weeks and anomaly scan at 20 – 23 weeks between the period of January 2009 and January 2010 were included in the study. A total of 1323 pregnant of different races who gave consent to participate during the study period were included in the analysis.

The analysis of the study included two types of scales to measure the variables, firstly ethnic origin, smoking status, maternal BMI, Parity, GA at delivery type of delivery were ordinal variables. A total of three variables were measured using scales such as cervical length at 11 – 13 +6 weeks, Cervical length at 20 – 26 +6 weeks and maternal age. Firstly, the descriptive statistics is presented in the following tables.

Descriptive statistics

Following table shows that about 74.8 of the participants belonged to White race followed by 9.5% of the South Asian and 7.8% of the participants belonging to Black race.

Ethnic origin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black	103	7.8	7.8	7.8
	East Asian	79	6.0	6.0	13.8
	South Asian	126	9.5	9.5	23.3
	White	989	74.8	74.8	98.0
	White-Black	11	.8	.8	98.9
	White-East Asian	6	.5	.5	99.3
	White-South Asian	9	.7	.7	100.0
	Total	1323	100.0	100.0	

From the following table, we can observe that the mean cervical length at 11 – 13 + 6 weeks is 33.51 with a standard deviation of 4.89. The mean cervical length at 20 – 26 weeks + 6 weeks 33.09 with a standard deviation of 5.47

Particulars	Mean	Std deviation	95% confidence interval	
			Lower bound	Upper bound
Cervical Length at 11 - 13 + 6 weeks	33.51	4.89	33.25	33.78
Cervical Length at 20 - 26 + 6 weeks	33.09	5.47	32.80	33.39

Following table shows that the mean cervical length at 11 – 13 + 6 weeks for black race was lowest with 31.88 and a standard deviation of 4.718 and highest for white – black 35.45 with a standard deviation of 4.180.

Mean cervical length of different races at 11 - 13 + 6 weeks

Race	Mean	Std deviation	95% confidence interval	
			Lower bound	Upper bound
Black	31.88	4.718	30.96	32.81
East Asian	32.71	4.985	31.59	33.83
South Asian	32.94	4.374	32.17	33.71
White	33.79	4.939	33.49	34.10
White-Black	35.45	4.180	32.65	38.26
White-East Asian	32.67	4.082	28.38	36.95
White-South Asian	34.56	3.575	31.81	37.30

Following table shows the highest mean cervical length at 20 – 26 + weeks for the black race was lowest with 30.76 and a standard deviation of 5.840 and highest with 33.38 for white race with a standard deviation of 5.282.

Mean cervical length of different races at 20 - 26 + 6 weeks

Race	Mean	Std deviation	95% confidence interval	
			Lower bound	Upper bound
Black	30.76	5.840	29.62	31.90
East Asian	32.90	6.153	31.52	34.28
South Asian	32.87	5.921	31.83	33.92
White	33.38	5.282	33.05	33.71
White-Black	33.27	5.217	29.77	36.78
White-East Asian	33.33	2.338	30.88	35.79
White-South Asian	32.89	4.512	29.42	36.36

Following table shows that, the age of the women belonging to black race was less with mean of 29.54 years and a standard deviation of 6.199 years. The age of the women belonging to white – south asian race was highest with a standard deviation of 4.807 years.

Mean maternal age of different races

Race	Mean	Std deviation	95% confidence interval	
			Lower bound	Upper bound
Black	29.54	6.199	28.33	30.76
East Asian	31.14	4.838	30.06	32.22
South Asian	30.80	4.340	30.04	31.57

White	31.92	4.949	31.61	32.23
White-Black	31.00	8.637	25.20	36.80
White-East Asian	32.33	9.201	22.68	41.99
White-South Asian	33.89	4.807	30.19	37.58

Following table shows that, about 5.1% of the women were smokers.

Smoking Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non Smoker	1255	94.9	94.9	94.9
	Smoker	68	5.1	5.1	100.0
	Total	1323	100.0	100.0	

From the following table we can observe that, about 47.2% of the women had a BMI of 18 – 24.9.

Maternal BMI

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BMI < 18	4	.3	.3	.3
	BMI 18 - 24.9	624	47.2	47.2	47.5
	BMI 25 - 29.9	608	46.0	46.0	93.4
	BMI > 30	87	6.6	6.6	100.0
	Total	1323	100.0	100.0	

From the following table we can observe that, about 61.9% of the women of all races under study were nullipara's.

Parity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Parity 0	819	61.9	61.9	61.9
	Parity 1	341	25.8	25.8	87.7
	Parity 2	116	8.8	8.8	96.4
	Parity >3	47	3.6	3.6	100.0
	Total	1323	100.0	100.0	

From the following table we can observe that, 78.5% of the women of all races had vaginal delivery.

Type of delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vaginal Delivery	1038	78.5	78.5	78.5
	Caesarian section	285	21.5	21.5	100.0
	Total	1323	100.0	100.0	

From the following table we can observe that about 99.5% of the women under study had live births.

Outcome of delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LB	1317	99.5	99.5	99.5
	SB	6	.5	.5	100.0
	Total	1323	100.0	100.0	

From the following table we can observe that 53.4% of the black, 58.2% of the East Asian, 52.4% of the South Asian, 45.5% of the White – black, 66.7% of the White – East Asian, 77.8% of the White – South Asian women had gestational age at delivery was 37 – 39 + 6 weeks. About 55.7% of the White women had a Gestational age of more than 40 weeks at delivery.

		GA at delivery				
		GA at delivery 24-33+6weeks	GA at delivery 34-36+6week	GA at delivery 37-39+6 weeks	GA at delivery > 40weeks	Total
Black	Count	6	5	55	37	103
	% within Ethnic origin	5.8%	4.9%	53.4%	35.9%	100.0%
East Asian	Count	0	1	46	32	79
	% within Ethnic origin	.0%	1.3%	58.2%	40.5%	100.0%
South Asian	Count	1	5	66	54	126
	% within Ethnic origin	.8%	4.0%	52.4%	42.9%	100.0%
White	Count	5	40	393	551	989
	% within Ethnic origin	.5%	4.0%	39.7%	55.7%	100.0%
White-Black	Count	0	2	5	4	11
	% within Ethnic origin	.0%	18.2%	45.5%	36.4%	100.0%
White-East Asian	Count	0	0	4	2	6
	% within Ethnic origin	.0%	.0%	66.7%	33.3%	100.0%
White-South Asian	Count	0	0	7	2	9
	% within Ethnic origin	.0%	.0%	77.8%	22.2%	100.0%
	Count	12	53	576	682	1323
	% within Ethnic origin	.9%	4.0%	43.5%	51.5%	100.0%

Bivariate statistics

Test - 1

In order to determine whether there is significant difference between different races in gestational age, a Kruskal – Wallis test was applied using SPSS. The null and alternate hypothesis is as follows,

Null Hypothesis: There is no significant difference between the average gestational age which spontaneous delivery occurs in different racial groups.

Alternate Hypothesis: There is a significant difference between the average gestation age which spontaneous delivery occurs in different racial groups.

Ranks

	Ethnic origin	N	Mean Rank
GA at delivery	Black	103	543.97
	East Asian	79	604.30
	South Asian	126	607.84
	White	989	689.46
	White-Black	11	525.05
	White-East Asian	6	563.17
	White-South Asian	9	493.28
	Total	1323	

Test Statistics[a,b]

	GA at delivery
Chi-square	29.269
df	6
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: Ethnic origin

From the above table, we see that the value of the chi-square test statistic is 29.269 and its corresponding p-value is 0.0001<0.05. Since the p-value of the test statistic is less than 0.05, there is sufficient evidence to conclude that there is a significant difference between the between the average gestational age which spontaneous delivery occurs in different racial groups.

Test - 2

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in black women, a paired t test was applied.

Ethnic origin		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Black	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	1.126	7.479	.737	-.335	2.588	1.528	102	.130

From the above table we can observe that the t value is 1.528 and its corresponding p value is 0.13 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of two trimesters in black women.

Test - 3

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in East Asian women, a paired t test was applied.

Ethnic origin		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
East Asian	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	-.190	6.479	.729	-1.641	1.261	-.260	78	.795

From the above table we can observe that the t value is -0.260 and its corresponding p value is 0.795 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of first and second trimesters in East Asian women.

Test - 4

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in South Asian women, a paired t test was applied.

Ethnic origin		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
South Asian	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	.063	6.634	.591	-1.106	1.233	.107	125	.915

From the above table we can observe that the t value is 0.107 and its corresponding p value is 0.915 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of first and second trimesters in South Asian women.

Test - 5

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in White women, a paired t test was applied.

Ethnic origin		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
White	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	.417	6.481	.206	.012	.821	2.021	988	.044

From the above table we can observe that the t value is 2.021 and its corresponding p value is 0.044 < 0.05. Since the p – value of the test statistic is less than 0.05; there is sufficient evidence to conclude that there is a significant difference in cervical length of first and second trimesters in White women.

Test - 6

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in White - Black women, a paired t test was applied.

Ethnic origin		Paired Differences							
					95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
White-Black	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	2.182	6.539	1.972	-2.211	6.575	1.107	10	.294

From the above table we can observe that the t value is 1.107 and its corresponding p value is 0.294 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of first and second trimesters in White - black women.

Test - 7

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in White - East Asian women, a paired t test was applied.

Ethnic origin		Paired Differences							Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
White-East Asian	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	-.667	4.274	1.745	-5.152	3.819	-.382	5	.718

From the above table we can observe that the t value is -0.382 and its corresponding p value is 0.718 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of first and second trimesters in White – East Asian women.

Test - 8

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester in White - South Asian women, a paired t test was applied.

Ethnic origin		Paired Differences							Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
White-South Asian	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	1.667	5.916	1.972	-2.881	6.214	.845	8	.423

From the above table we can observe that the t value is 0.845 and its corresponding p value is 0.423 > 0.05. Since the p – value of the test statistic is more than 0.05, there is sufficient evidence to conclude that there is no significant difference in cervical length of first and second trimesters in White - South Asian women.

Test - 9

In order to test whether there is a significant difference in cervical length between the first trimester and second trimester, a paired t test was applied.

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Cervical Length at 11 - 13 + 6 weeks - Cervical Length at 20 - 26 + 6 weeks	.420	6.563	.180	.066	.774	2.329	1322	.020

From the above table we can observe that the t value is 2.329 and its corresponding p value is 0.02 < 0.05. Since the p – value of the test statistic is less than 0.05; there is sufficient evidence to conclude that there is a significant difference in cervical length of first and second trimesters.

Test - 10

In order to test whether there is a significant difference in cervical length at $11 – 13 + 6$ weeks between different gestational age groups among black women, Analysis of Variance (ANOVA) was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	Df	Mean Square	F	Sig.
Black	Between Groups	175.141	3	58.380	2.758	.046
	Within Groups	2095.461	99	21.166		
	Total	2270.602	102			

Table above shows that there was a statistically significant difference between the means of the cervical length at $11 – 13+ 6$ weeks between different gestational groups in black women, at a significance level with 3 degrees of freedom and 99 for within group mean squares (variance

estimate). The critical value of F is 2.7. Since its computed value is 2.758, which is more than the critical value.

Test - 11

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among East Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
East Asian	Between Groups	7.846	2	3.923	.154	.857
	Within Groups	1930.458	76	25.401		
	Total	1938.304	78			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13+ 6$ weeks between different gestational groups among East Asian women, at a significance level with 2 degrees of freedom and 76 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 0.154, which is less than the critical value.

Test - 12

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among South Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	Df	Mean Square	F	Sig.
South Asian	Between Groups	28.281	3	9.427	.487	.692
	Within Groups	2363.211	122	19.371		
	Total	2391.492	125			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13+ 6$ weeks between different gestational groups among South Asian women, at a significance level with 3 degrees of freedom and 122 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 0.487, which is less than the critical value.

Test - 13

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among White women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White	Between Groups	110.720	3	36.907	1.515	.209
	Within Groups	23994.613	985	24.360		
	Total	24105.333	988			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13 + 6$ weeks between different gestational groups among White women, at a significance level with 3 degrees of freedom and 985 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 1.515, which is less than the critical value.

Test - 14

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among White - Black women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	Df	Mean Square	F	Sig.
White-Black	Between Groups	15.027	2	7.514	.376	.698
	Within Groups	159.700	8	19.963		
	Total	174.727	10			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13 + 6$ weeks between different gestational groups among White - Black women, at a significance level with 2 degrees of freedom and 8 for within group mean squares (variance estimate). The critical value of F is 4. Since its computed value is 0.376, which is less than the critical value.

Test - 15

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among White – East Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White-East Asian	Between Groups	44.083	1	44.083	4.493	.101
	Within Groups	39.250	4	9.813		
	Total	83.333	5			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13+ 6$ weeks between different gestational groups among White – East Asian women, at a significance level with 1 degrees of freedom and 4 for within group mean squares (variance estimate). The critical value of F is 8. Since its computed value is 4.493, which is less than the critical value.

Test - 16

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups among White – South Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White-South Asian	Between Groups	.794	1	.794	.055	.822
	Within Groups	101.429	7	14.490		
	Total	102.222	8			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13+ 6$ weeks between different gestational groups among White – South Asian women, at a significance level with 1 degrees of freedom and 7 for within group mean squares (variance estimate). The critical value of F is 6. Since its computed value is 0.55, which is less than the critical value.

Test - 16

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among Black women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
Black	Between Groups	363.433	3	121.144	3.850	.012
	Within Groups	3115.499	99	31.470		
	Total	3478.932	102			

Table above shows that there was a statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups in black women, at a significance level with 3 degrees of freedom and 99 for within group mean squares (variance estimate). The critical value of F is 2.7. Since its computed value is 3.850, which is more than the critical value.

Test - 17

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among East Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
East Asian	Between Groups	97.808	2	48.904	1.302	.278
	Within Groups	2855.382	76	37.571		
	Total	2953.190	78			

Table above shows that there was no statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups among East Asian women, at a significance level with 2 degrees of freedom and 76 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 1.302, which is less than the critical value.

Test - 18

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among South Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
South Asian	Between Groups	78.938	3	26.313	.746	.527
	Within Groups	4303.030	122	35.271		
	Total	4381.968	125			

Table above shows that there was no statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups among South Asian women, at a significance level with 3 degrees of freedom and 122 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 0.746, which is less than the critical value.

Test - 19

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among White women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White	Between Groups	491.990	3	163.997	5.966	.000
	Within Groups	27074.578	985	27.487		
	Total	27566.568	988			

Table above shows that there was a statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups among White women, at a significance level with 3 degrees of freedom and 985 for within group mean squares (variance estimate). The critical value of F is 3. Since its computed value is 5.966, which is more than the critical value.

Test - 20

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among White - Black women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White-Black	Between Groups	25.732	2	12.866	.418	.672
	Within Groups	246.450	8	30.806		
	Total	272.182	10			

Table above shows that there was no statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups among White - Black women, at a significance level with 2 degrees of freedom and 8 for within group mean squares (variance estimate). The critical value of F is 4. Since its computed value is 0.418, which is less than the critical value.

Test - 21

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among White – East Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White-East Asian	Between Groups	4.083	1	4.083	.703	.449
	Within Groups	23.250	4	5.813		
	Total	27.333	5			

Table above shows that there was no statistically significant difference between the means of the cervical length at $20 - 26 + 6$ weeks between different gestational groups among White – East Asian women, at a significance level with 1 degrees of freedom and 4 for within group mean squares (variance estimate). The critical value of F is 8. Since its computed value is 0.703, which is less than the critical value.

Test - 22

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups among White – South Asian women, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

Ethnic origin		Sum of Squares	df	Mean Square	F	Sig.
White-South Asian	Between Groups	6.675	1	6.675	.299	.601
	Within Groups	156.214	7	22.316		
	Total	162.889	8			

Table above shows that there was no statistically significant difference between the means of the cervical length at $20 – 26 + 6$ weeks between different gestational groups among White – South Asian women, at a significance level with 1 degrees of freedom and 7 for within group mean squares (variance estimate). The critical value of F is 6. Since its computed value is 0.299, which is less than the critical value.

From the following table we can observe significant correlations between cervical length at 11 – 13 years and cervical length at 20 -26 weeks for gestational age at delivery especially in Black, White – black, White East Asian, and White south Asian races, while there was significant correlation between cervical length at different trimesters and gestational age in East Asian, South Asian and White races.

Correlations

Ethnic origin	Control Variables			Cervical Length at 11 - 13 + 6 weeks	Cervical Length at 20 - 26 + 6 weeks
Black	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	.034
			Significance (2-tailed)	.	.732
			df	0	100
		Cervical Length at 20 - 26 + 6 weeks	Correlation	.034	1.000
			Significance (2-tailed)	.732	.
			df	100	0
East Asian	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	.342
			Significance (2-tailed)	.	.002
			df	0	76

		Cervical Length at 20 - 26 + 6 weeks	Correlation	.342	1.000
			Significance (2-tailed)	.002	.
			df	76	0
South Asian	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	.200
			Significance (2-tailed)	.	.025
			df	0	123
		Cervical Length at 20 - 26 + 6 weeks	Correlation	.200	1.000
			Significance (2-tailed)	.025	.
			df	123	0
White	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	.195
			Significance (2-tailed)	.	.000
			df	0	986
		Cervical Length at 20 - 26 + 6 weeks	Correlation	.195	1.000
			Significance (2-tailed)	.000	.
			df	986	0
White-Black	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	.062
			Significance (2-tailed)	.	.865
			df	0	8
		Cervical Length at 20 - 26 + 6 weeks	Correlation	.062	1.000
			Significance (2-tailed)	.865	.
			df	8	0
White-East Asian	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	-.124
			Significance (2-tailed)	.	.842
			df	0	3
		Cervical Length at 20 - 26 + 6 weeks	Correlation	-.124	1.000
			Significance (2-tailed)	.842	.
			df	3	0
White-South Asian	GA at delivery	Cervical Length at 11 - 13 + 6 weeks	Correlation	1.000	-.041
			Significance (2-tailed)	.	.923
			df	0	6
		Cervical Length at 20 - 26 + 6 weeks	Correlation	-.041	1.000
			Significance (2-tailed)	.923	.
			df	6	0

In order to test whether there is a significant difference in cervical length at $11 - 13 + 6$ weeks between different gestational age groups, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 11 - 13 + 6 weeks

GA at delivery		Sum of Squares	df	Mean Square	F	Sig.
GA at delivery 24-33+6weeks	Between Groups	2.167	2	1.083	.140	.871
	Within Groups	69.500	9	7.722		
	Total	71.667	11			
GA at delivery 34-36+6week	Between Groups	64.804	4	16.201	.456	.767
	Within Groups	1703.875	48	35.497		
	Total	1768.679	52			
GA at delivery 37-39+6 weeks	Between Groups	221.093	6	36.849	1.519	.170
	Within Groups	13805.155	569	24.262		
	Total	14026.248	575			
GA at delivery>40weeks	Between Groups	390.539	6	65.090	2.909	.008
	Within Groups	15105.590	675	22.379		
	Total	15496.129	681			

Table above shows that there was no statistically significant difference between the means of the cervical length at $11 - 13 + 6$ weeks between different gestational age at $24 - 33 + 6$ weeks, $34 - 36 + 6$ weeks and $37 - 39 + 6$ weeks. But there was a statistically significant difference between the cervical length at $11 - 13 + 6$ weeks and gestational age at delivery for more than 40 weeks.

In order to test whether there is a significant difference in cervical length at $20 - 26 + 6$ weeks between different gestational age groups, Analysis of Variance (ANOVA) test was applied.

ANOVA

Cervical Length at 20 - 26 + 6 weeks

GA at delivery		Sum of Squares	df	Mean Square	F	Sig.
GA at delivery 24-33+6weeks	Between Groups	95.333	2	47.667	1.570	.260
	Within Groups	273.333	9	30.370		
	Total	368.667	11			
GA at delivery 34-36+6week	Between Groups	170.383	4	42.596	.796	.534
	Within Groups	2568.900	48	53.519		
	Total	2739.283	52			

GA at delivery 37-39+6 weeks	Between Groups	288.670	6	48.112	1.584	.149
	Within Groups	17286.656	569	30.381		
	Total	17575.326	575			
GA at delivery>40weeks	Between Groups	216.868	6	36.145	1.383	.219
	Within Groups	17645.515	675	26.142		
	Total	17862.383	681			

Table above shows that there was no statistically significant difference between the means of the cervical length at 20 – 26 + 6 weeks between different gestational age groups with their degrees of freedom and critical value.